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09/491,810	01/28/2000	Thomas Justin Sullivan	10981801-1	9074

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EXAMINER
MEONSKE, TONIA L

ART UNIT	PAPER NUMBER
2183	

DATE MAILED: 09/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No	Applicant(s)
	09/491,810	SULLIVAN, THOMAS JUSTIN
Office Action Summary	Examiner	Art Unit
	Tonia L Meonske	2183

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-15</u> is/are pending in the application.

　　4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-15</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 January 2000</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

　　Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

　　If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

　　a)☐ All b)☐ Some * c)☐ None of:

　　　1.☐ Certified copies of the priority documents have been received.

　　　2.☐ Certified copies of the priority documents have been received in Application No. _____ .

　　　3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

　　* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

　　a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4)☐ Interview Summary (PTO-413) Paper No(s). _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____ .

U.S. Patent and Trademark Office

PTO-326 (Rev. 04-01)　　　　Office Action Summary　　　　Part of Paper No. 2

DETAILED ACTION

Drawings

1.) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: on page 2, line 6, "MAC units 11(A&B)," on page 8, line 15 "22-24" (please change to A22, B23, and C24), on page 9, line 1 "22-24" (please change to A22, B23, and C24). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2.) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: In figure 1, elements "11A-C, 28A-B, 22-24, and 12A-12C," in figure 2, elements "28, 82, 76, 74, and 48," and in figure 4, elements 111, 112, 113, 135, and 136." A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3.) The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

4.) The abstract of the disclosure is objected to because acronyms are used without spelling out the words that the letters in the acronyms stand for the first time the

acronyms are used, namely SIMD, MAC, and MISC. Correction is required. See MPEP

§ 608.01(b).

Claim Objections

5.) Claims 3 and 5 are objected to for failing to comply with the second paragraph of 35

U.S.C. 112, which reads:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
>
> subject matter which the applicant regards as his invention.

6.) Claim 3 recites the limitation "substantially currently." This limitation does not make

sense in the claims. Examiner believes that Applicant intended the limitation to read

"substantially concurrently" instead of "substantially currently." Appropriate correction

is required.

7.) Claim 5 is recites the limitation "release" in line 3. This limitation is not

grammatically correct in the claim. Examiner believes that Applicant intended the

limitation to read "released" instead of "release." Appropriate correction is required.

8.) Claims 9 and 10 are objected to for containing two semicolons after the limitation

"the step of." Please delete one of the semicolons in each claim.

Claim Rejections - 35 USC § 102

9.) The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form

the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the
> United States before the invention thereof by the applicant for patent, or on an international application
> by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this
> title before the invention thereof by the applicant for patent.

10.)   The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act

of 1999 (AIPA) do not apply to the examination of this application as the application

being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35

U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

11.)   Claims 1-3 are rejected under 35 U.S.C. 102(e) as being anticiapted by Roussel et

al., US Patent 6,230,257 B1.

12.)   Referring to claim 1, Roussel et al. have taught an apparatus for performing

Single Instruction Multiple Data (SIMD) instructions using a single multiply accumulate

(MAC) unit while minimizing the operational latency, said apparatus comprising:

    (a) a MAC unit, said MAC unit generates a first half of a data result and a second

half of a data result (Figure 3, column 3, lines 21-43, the first half, or low order,

of the data result is $(x1+y1)(x0+y0)$, the second half, or high order, of a data

result is $(x3+y3)(x2+y2)$, which are both generated from a MAC unit);

    (b) a defer register stores said first half of a data result (column 4, lines 40-48, the

low order results are held in delay element, or defer register, M3); and

    (c) a miscellaneous (MISC) unit, said MISC unit determines when to release said

first half of a data result stored in said defer register to synchronize said first half

of a data result with said second half of said data result. (column 4, lines 40-

48,There is a MISC unit that determines when to write, or release, the results to

the register file, depending upon when the high order results are ready. When the

results of the first and second halves of the data result are written to the register

file, the first half of the data result is "synchronized" with the second half of the

data result.)

13.)   Referring to claim 2, Roussel et al. have taught the apparatus of claim 1, as

described above, wherein said MAC unit generates said first half of a data result before

said second half of said data result. (Figure 3, the first half, or low order result, is

generated before the second half, or high order result)

14.)   Referring to claim 3, Roussel et al. have taught the apparatus of claim 2, as

described above, further comprising: a register file, wherein said register file receives

said first half of said data result substantially concurrently with said second half of said

data result. (column 4, lines 40-48, the results of both processing steps are written to the

register file via port 3, so the register file receives the first half and the second half of the

data results substantially concurrently)

Claim Rejections - 35 USC § 103

15.)   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth
> in section 102 of this title, if the differences between the subject matter sought to be patented and the
> prior art are such that the subject matter as a whole would have been obvious at the time the invention
> was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability
> shall not be negatived by the manner in which the invention was made.

16.)   Claims 4-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Roussel et al., US Patent 6,230,257 B1, in view of Phillips et al, US Patent 6,038,652.

17.)   Referring to claim 4, Roussel et al. have taught the apparatus of claim 3, as

described above, but Roussel et al. have not specifically taught wherein said MISC unit

generates an exception result if said MISC unit determines said first half of said data

result is in error. However, Phillips et al. have taught that overflow or other exceptions may occur during multiply and accumulate functions and that it is necessary to report the exception in an efficient manner so that appropriate action can be taken (column 1, lines 20-46, column 4, lines 29-39). When the first half of the data result experiences an overflow, it is necessary for the exception to be reported. It would have been obvious to one of ordinary skill in that art at the time the invention was made to have the apparatus of Roussel et al. generate an exception result if said MISC unit determines said first half of said data result is in error, so that the exception can be reported and appropriate action can be taken.

18.)   Referring to claim 5, Roussel et al. and Phillips et al. have taught the apparatus of claim 4, as described above. Roussel et al. have not specifically taught wherein said MISC unit further determines if said first half of a data result stored in said defer register or said exception result is to be released to said register file. However when there is not an error, the calculated result should be stored in the register file as usual, and when there is an exception, the exception result should be stored in the register file in order to report and correct the exception in an efficient manner. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the MISC unit of Roussel et al. determine if said first half of a data result stored in said defer register or said exception result is to be released to said register file, so that the exception can be reported and corrected in an efficient manner.

19.) Referring to claim 6, Roussel et al. have taught a method for performing Single

Instruction Multiple Data (SIMD) instructions using a single multiple accumulate (MAC)

unit while minimizing the operational latency, comprising the steps of:

(a) generating a first operand data result by said MAC unit; (Figure 3, column 3,

lines 21-43, the first half, or low order, of the data result is $(x1+y1)(x0+y0)$,

which is generated from a MAC unit (column 4, lines 23-47))

(b) inputting said first operand data result to a deferred register; (column 4, lines

40-48, the low order results are held in delay element, or defer register, M3)

(c) generating a second operand data result by said MAC unit; (Figure 3, column

3, lines 21-43, the second half, or high order, of a data result is $(x3+y3)(x2+y2)$,

which are generated from a MAC unit (column 4, lines 23-47))

(d) inputting said first operand data result and said second operand data result into

a buffer (column 4, lines 40-48, The first and second operand results are written to

a register file, or buffer)

20.) Roussel et al. have not specifically taught generating an exception result by said

by a MISC unit; inputting said first operand data result and said second operand data

result into a buffer if said MISC logic determines that said first operand data result and

said second operand data result are valid; and inputting said exception result into said

buffer if said MISC unit determines that said first operand data result and said second

operand data result are invalid. However, Phillips et al. have taught that overflow or

other exceptions may occur during multiply and accumulate functions and that it is

necessary to report the exception in an efficient manner so that appropriate action can be

taken (column 1, lines 20-46, column 4, lines 29-39). Generating an exception result and

inputting said exception result into a buffer if the operand data's are invalid is an efficient

way to correct the exception because the exception is immediately treated upon detection.

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to have the method for performing SIMD instructions, as taught by Roussel et

al., include: generating an exception result by said by a MISC unit; inputting said first

operand data result and said second operand data result into a buffer if said MISC logic

determines that said first operand data result and said second operand data result are

valid; and inputting said exception result into said buffer if said MISC unit determines

that said first operand data result and said second operand data result are invalid, so that

when an exception occurs, the exception can be reported and corrected immediately in an

efficient manner.

21.)   Referring to claim 7, Roussel et al. and Phillips et al. have taught the method of

claim 6, as described above, further comprising the steps of:

> (a) latching a first operand data into said MAC unit (Figure 4A and Figure 5, the
>
> first operand data is latched into M3 in Figure 4A, and into element 400 in Figure
>
> 5); and
>
> (b) latching a second operand data into said MAC unit. (Figure 4A and Figure 5,
>
> the second operand data is latched into M1 and M2 in Figure 4A, and into
>
> elements 190 and 200 in Figure 5.)

22.)   Referring to claim 8, Roussel et al. and Phillips et al. have taught the method of

claim 7, as described above, further comprising the steps of:

(a) generating said first operand data result from said first operand; (Figure 3,

column 3, lines 21-43, the first half, or low order, of the data result is

(x1+y1)(x0+y0), which is generated from first operand data x1x0 and y1y0) and

(b) generating said second operand data result from a second operand data.

(Figure 3, column 3, lines 21-43, the second half, or high order, of the data result

is (x3+y3)(x2+y2), which is generated from first operand data x3x2 and y3y2))

23.)   Referring to claim 9, Roussel et al. and Phillips et al. have taught the method of

claim 6, as described above, further comprising the step of:

(a) latching a first operand and a second operand data into said MISC unit.

(Figure 4A and Figure 5, the first operand is latched into M3 in Figure 4A, and

into element 400 in Figure 5, the second operand data is latched into M1 and M2

in Figure 4A, and into elements 190 and 200 in Figure 5)

24.)   Referring to claim 10, Roussel et al. and Phillips et al. have taught the method of

claim 9, as described above, further comprising the step of:

(a) generating said exception from said first operand and said second operand

data. (Phillips et al. have taught that overflow or other exceptions may occur

during multiply and accumulate functions and that it is necessary to report the

exception in an efficient manner so that appropriate action can be taken (column

1, lines 20-46, column 4, lines 29-39), an overflow exception is inherently

generated from the first and second operand data)

25.)   Claim 11 does not recite limitations above the claimed invention set forth in claim

6 and is therefore rejected for the same reasons set forth in the rejection of claim 6 above.

26.)   Claim 12 does not recite limitations above the claimed invention set forth in claim

7 and is therefore rejected for the same reasons set forth in the rejection of claim 7 above.

27.)   Claim 13 does not recite limitations above the claimed invention set forth in claim

8 and is therefore rejected for the same reasons set forth in the rejection of claim 8 above.

28.)   Claim 14 does not recite limitations above the claimed invention set forth in claim

9 and is therefore rejected for the same reasons set forth in the rejection of claim 9 above.

29.)   Claim 15 does not recite limitations above the claimed invention set forth in claim

10 and is therefore rejected for the same reasons set forth in the rejection of claim 10

above.

Conclusion

30.)   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Tonia L Meonske whose telephone number is (703) 305-

3993. The examiner can normally be reached on Monday-Friday, 8-4:30.

31.)   If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eddie Chan can be reached on (703) 305-9712. The fax phone numbers for

the organization where this application or proceeding is assigned are (703) 746-7239 for

regular communications and (703) 746-7238 for After Final communications.

32.)   Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is (703) 305-

3900.

Art Unit: 2183

tlm
September 23, 2002

RICHARD L. ELLIS
PRIMARY EXAMINER